

# Chapter 12

## Piers, Docks and Overwater Structures

### Phase 3, Task 3.4

### Shoreline Master Program Planning Process

## Introduction

Piers, docks and other overwater and in-water structures are significant components of our shorelines. They play a major role in commerce at ports and provide recreational opportunities at parks. Piers, docks and swimming floats are common at single family and multi- family residences on the shoreline, particularly on lakes and marine bays. While these structures are important for commerce and recreation, they also can have impacts on the shoreline ecology, aesthetics and navigation.

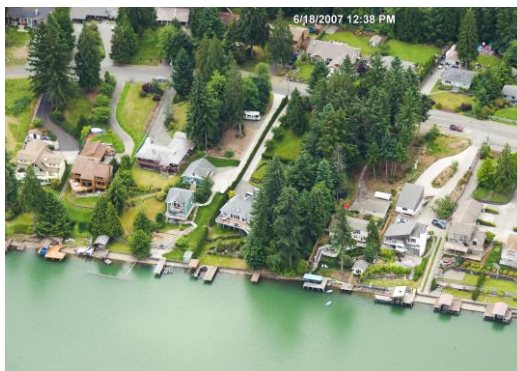


Figure 1: Piers, docks, and boat launches come in various shapes and sizes to provide access to the water. Photos: Upper left, Washington Coastal Atlas; upper right, Hugh Shipman; bottom, City of Kirkland.

Shoreline Master Programs should include policies and regulations regarding piers, docks and other overwater and in-water structures. SMPs will not be adequate if they only refer to and rely on state and federal agency documents, such as the Army Corps of Engineers Regional General Permits.

The shoreline inventory and characterization should inform where overwater structures such as piers and docks may be allowed. Portions of the shoreline may not be appropriate for these overwater structures due to impacts to shoreline ecological functions, navigation and aesthetics. In some areas, water levels are low, so moorage facilities need to be very long to reach adequate depth for boats. In other areas, wave and wind action will damage or destroy moorage facilities.

This guidance focuses on the overwater structures discussed below. Marinas are not covered here and will be discussed in a separate section of the Handbook in the future. The SMP Guidelines address “boating facilities” including marinas, but exclude “docks serving four or fewer single family residences” from “boating facilities.” SMPs should define how many moorage facilities constitute a marina.

Floating homes, also known as houseboats, are residences built on floats. The SMP Guidelines prohibit new overwater residences including floating homes [WAC 173-26-241(3)(j)] but allow improvements associated with life safety matters and property rights. Floating homes are not addressed here.

## **Descriptions of overwater structures**

A common understanding of these overwater and in-water structures will be helpful. Here are Ecology’s descriptions of these structures. We will often refer to “moorage facilities” or “piers and docks” in this document as a general term that covers most or all of these structures.

- Piers and docks adjoin the shoreline, extend over the water, and serve as a landing or moorage place for commercial, industrial and pleasure watercraft.
  - Piers are built on fixed platforms and sit above the water.
  - Docks are anchored to the land, substrate or the pier with pilings or anchors and float on the water.
- Gangways are walkways that connect the pier to the dock. Gangways are often used in areas where the water level changes due to tides or seasonal variations.
- Ells are extensions of piers, often in a U-shape or L shape, that provide additional watercraft moorage.
- Recreational floats are platforms that float on the water’s surface. They are anchored off-shore and are used for swimming and fishing. Some floats have components such as slides and trampolines.
- Boat houses basically serve as garages for boats. They have walls and a roof, and are situated on the water or just above the water’s edge.



Figure 2: A boat house on Whidbey Island shelters the boat from the weather. Photo by Betty Renkor.

- Mooring buoys typically include an anchoring system with an anchor and anchor line, a float marking its location, and a fitting for a vessel's mooring chain or hawser. Washington laws establish two categories for mooring buoys -- commercial and recreational (RCW 79.105.430). Commercial buoys are typically used for temporary moorage of a vessel that is awaiting transit or loading or offloading. Recreational buoys are used as semi-permanent moorage for recreational vessels.

- Mooring piles or pilings are fixed poles or groups of poles set in the substrate and extending above the water line.
- Lifts or boat lifts raise watercraft out of the water for launching or storing. They may be attached to the substrate, a pier or dock, bulkhead or float or be located upland.
- Canopies are covers that protect watercraft from the sun and rain.
- Boat or launch ramps are solid or relatively solid surfaces that bridge land and water and are used for moving watercraft into and out of the water.
- Railways are rails attached to the substrate used for launching and retrieving watercraft, usually with a cradle and winch system.
- Others such as jet ski floats and boat dry docks provide storage of watercraft out of the water. Some floats serve as helicopter pads, while others are used for docking seaplanes.

## SMP Guidelines

The SMP Guidelines [[WAC 173-26-231](#)] address shoreline modifications including piers and docks, shoreline stabilization, breakwaters and others. SMPs shall implement the following principles for all shoreline modifications:

- Allow structural shoreline modifications only where necessary to support or protect an allowed primary structure or legally existing shoreline use.

*WAC 173-26-231(3)(b): ...Pier and dock construction shall be restricted to the minimum size necessary to meet the needs of the proposed water-dependent use. Water-related and water-enjoyment uses may be allowed as part of mixed-use development on over-water structures where they are clearly auxiliary to and in support of water-dependent uses, provided the minimum size requirement needed to meet the water-dependent use is not violated...*





Figure 3: The 300-foot pier at Kayak Point County Park in Snohomish County provides opportunities for fishing and crabbing. Photo by Hugh Shipman.

- Reduce adverse effects of and limit shoreline modifications in number and extent.
- Allow only modifications appropriate to the type of shoreline and environmental conditions for which they are proposed.
- Assure that shoreline modifications individually and cumulatively do not result in a net loss of ecological functions.
- Base SMP provisions on scientific and technical information and a comprehensive analysis of drift cells or reach conditions.
- Plan to enhance impaired ecological functions while accommodating permitted uses.

WAC 173-26-231(3)(b) direct that new piers and docks be allowed only for water-dependent uses or public access. A pier or dock associated with a single-family residence that provides access to watercraft is a water-dependent use.

Applicants must demonstrate that a specific need exists for new pier or dock construction to support water-dependent uses, except for those that are accessory to single-family residences.

- For residential development, SMPs should require two or more dwellings provide joint use or community dock facilities when feasible, rather than allow individual docks for each residence. Joint use docks will have reduced impacts to the shoreline environment

and navigation compared with individual docks and result in shared costs for the owners.

- For port districts, commercial or public entities with water-dependent uses, a needs analysis or master plan that projects future needs for pier or dock space and is approved by the local government and consistent with the SMP Guidelines may satisfy the demonstration requirement.

All piers and docks must be built to avoid, or if that is not possible, minimize and mitigate impacts to ecological processes and functions and critical areas resources. This requirement also would apply to other overwater structures described above.

## Impacts of overwater structures

About 5,500 piers and docks exist in the marine waters of Washington State (DNR, 2009). Overwater structures such as piers and docks, boat houses and others can have adverse impacts on the environment, navigation and aesthetics. This section provides a brief review of impacts that should be considered as you determine whether and where to allow these structures on your shoreline.

### Environmental impacts

Overwater structures can have impacts on various factors that control habitats. These include light, wave energy, substrates and water quality. Except as noted, the impacts summarized in this section and the recommendations are from *Overwater Structures: Marine Issues* (Nightingale and Simenstad, 2001) and *Over-Water Structures: Freshwater Issues* (Carrasquero, 2001).

- Changes to light affect the behavior of salmon. Salmon fry have been seen avoiding travel under docks and piers during daylight hours. As they move away from the shore, they become subject to attack by larger predators that typically stay in deeper waters. The amount of light also affects salmon feeding – with less light, they eat less.



Figure 4: A pier in Tramp Harbor, Vashon Island, casts a shadow on the water. Photo by Hugh Shipman.

- With less light, there are fewer small species that salmon eat. Food is less available.
- Reductions in light affect the growth of sea grasses such as eelgrass, which provides a rich feeding area for marine birds and fish, and offers shelter to species such as Dungeness crab, salmon and herring.
- Changes to the substrate result from pile driving and the presence of piles. Pile driving rearranges the distribution of sediments, resulting in changes to the substrate bathymetry of the water body. Pilings take up space, reducing habitat; cast shade, affecting light; catch floating debris, affecting light and habitat. Pilings also develop into a pile community, resulting in shell hash on the substrate that affects habitat.
- Invasive species have been found to settle out on floats and supporting structures.
- The movement of sediment along marine shorelines (littoral drift) is affected by placement of overwater structures. Changes in sediment movement limit the availability of substrate for spawning forage fish and the sand available to down-drift beaches.
- Pile driving will have temporary impacts on water quality by increasing turbidity.
- Habitat is lost and habitat fragmentation occurs when vegetation is removed for construction of overwater structures, and the staircases, trails and walkways that are used to get to them. Loss of plant species and disruptions of the ecosystem can lead to a loss in animal diversity. (*Protection of Marine Riparian Functions in Puget Sound, Washington*, J. Brennan et al, 2009.)

### **Recommendations to reduce impacts**

- Increase pier height and decrease pier and dock width.
- Use a north-south pier-dock orientation.
- Place piers and docks in deep water to avoid impacts to eelgrass.
- Avoid prop scour by placing docks at depths that are at least 4-5 feet above MLLW. (MLLW is effectively 0 tide.)
- Use glass inserts, grating and reflective panels on piers and docks.
- Use artificial lighting under piers in daylight hours.
- Avoid artificial light at night.
- Chain and anchor float attachments to land to allow movement of the float with tide and wind conditions. This movement has been found to avoid light limitation stressors to eelgrass.
- Remove docks and floats during the off-season.
- Decrease number of pilings.
- Use light reflective piling materials.



Figure 5: Glass blocks at the Clinton ferry terminal allow light to pass through to the water below. Glass blocks must be kept clean to be effective. Photo by Barbara Nightingale.

Some additional recommendations from Ecology:

- Check with watercraft associations for information on needed water depths and storage.
- Require bathymetry information from the applicant if you don't already have it.
- Use the inventory and characterization to help determine appropriate regulations for moorage facilities.

The following habitat stewardship measures from the Washington Department of Natural Resources are applied on a site-specific basis as appropriate to DNR lease holders. The full list of stewardship measures is included at the end of this chapter. DNR's web page, [\*Preventing Impacts to Important Aquatic Habitats\*](#), has additional recommendations.

- Wood treated with toxic compounds should not be used for decking, pilings or other in-water components.
- Tires should not be used on moorage facilities, even for fenders.
- Foam material should be encapsulated so it cannot break up and be released into water.
- New covered moorage and boat houses should not be allowed.
- Docks, piers and floats should be 8 meters from native aquatic vegetation or the distance that the structure will cast shade, whichever is greater.
- New or reconfigured structures should be sited to avoid impacts to forage fish habitat.
- Floating or suspended watercraft lifts should be more than 9 feet waterward of the OHWM.
- Skirting is prohibited on overwater structures.



- New activities and structures should avoid existing native vegetation attached to or rooted in the substrate.

Recommendations to reduce impacts are also available in the following two technical guidance documents developed by several state agencies and posted on the Washington Department of Fish and Wildlife website:

- [\*Land Use Planning for Salmon, Steelhead and Trout\*](#)
- [\*Protecting Nearshore Habitat and Functions in Puget Sound\*](#)



Figure 6: The City of Raymond's community pier includes grating to allow light to reach the water. Photo by Barbara Nightingale.

## Impacts on navigation

Moorage facilities can affect travel on the water by large vessels and small personal watercraft such as canoes, kayaks and small fishing boats. Moorage facilities can make it difficult for vessels and watercraft to move through an area.

In some areas, the number and density of moorage facilities makes it difficult for boaters to get into their own slip. Long piers and docks force small boats out into deeper and sometimes more turbulent waters. Long piers and docks can also interfere with activities on the water such as boat racing, sailboarding, and fishing.

There's been a trend toward bigger and longer power and sailboats by recreational boat owners. Bigger boats often require bigger piers and docks, so the boat owners request shoreline permits, sometimes variances, to increase the length of the pier or dock to either accommodate the length of the boat or reach deeper water depth to accommodate the boat draft.

SMPs should set parameters for the length and location of piers and docks and other moorage facilities. A navigational safety study may be required if proposed lengths exceed the standards.

Keep in mind the shoreline ecological functions and shoreline conditions when setting standards for length and location of moorage facilities. In areas with habitat such as eelgrass, locating structures in deeper water would reduce impacts to the eelgrass. But longer facilities could interfere with navigation. It may be impossible to reconcile these conflicts.

Moorage facilities should not interfere with legal public access to the shoreline or use of the shoreline. According to the Public Trust Doctrine, a legal principle from English Common Law and supported by courts in the U.S., the waters of the state are a public resource owned by and





Figure 7: The density of docks, like these in Lake Washington, can make navigation difficult for local boat owners. Washington Coastal Atlas photo.

available to all citizens equally for the purposes of navigation, conducting commerce, fishing, recreation, and similar uses. Private ownership of the underlying land does not invalidate this trust.

Consider the following when developing policies and regulations:

- Overwater structures can be safety hazards. Moorage facilities should be marked with reflectors to reduce hazards for nighttime water users.
- Moorage facilities should be spaced and oriented to minimize hazards and obstructions to navigation and other water-oriented activities such as fishing, swimming and pleasure boating, as well as adjacent land owners.
- The length, width and height of piers and docks should be no greater than that required for safety and practicality for the primary use.
- The fetch -- distance from shoreline to the opposite shoreline -- will be a factor in determining the length of piers and docks. In small embayments, room for navigation is limited. Piers and docks should not interfere with navigation.
- If space is not adequate, moorage facilities should be prohibited.

## Impacts on aesthetics

Piers and docks, boat lifts, boat canopies and boat houses as well as watercraft can affect views from public spaces as well as private property. People vary in their sense of aesthetics – some are satisfied with a shoreline full of piers, boats, masts and boat canopies, while others prefer a shoreline unencumbered with the same. It is important to get a sense of your community's preferences during the SMP update process.



Figure 8: Piers on Horseshoe Bay in Pierce County extend out to reach the water during low tides. Washington Coastal Atlas photo.

A few questions to consider:

- If a shoreline lacks piers and docks now, what aesthetic impacts would future ones have? You can conduct a visual impact analysis using NOAA's CanVis software available at <http://www.csc.noaa.gov/digitalcoast/tools/canvis/>.
- Is the local community concerned about aesthetics? If so, should boat houses that can block views be prohibited? Should the number of piers and docks and other moorage facilities be limited? Should the SMP require moorage facilities to be compatible with local physical and visual character?
- Piers in some shallow marine areas provide access to watercraft for limited time periods due to the tides. When the tide is out, the piers are standing above the mudflats, and boats are sometimes "stranded" on the mud. Or, piers are very long so that the end of the pier is always in the water. Are these areas appropriate for piers and docks?

## Impacts from multiple moorage facilities

The issues of impacts to navigation, the environment and aesthetics sometimes come in one permit application. A proposed project may include a long pier-dock, a float or a floating boat lift, and a mooring buoy. The dock must be long in order to reach adequate water depth or to provide the docking area beyond a patch of eelgrass. Such a long dock might provide reduced impacts to the eelgrass, but could have impacts on other aquatic habitat, interfere with navigation or have aesthetic impacts. For example, one proposal included a 100-foot dock, a floating boat lift more than 400 feet offshore and a mooring buoy.

How should the SMP address these proposals? Some options:

- Limit the length of piers and docks. Boats that need adequate water depth or located away from eelgrass areas can be moored to buoys.
- Allow private docks only if there are no other alternatives, such as marinas within a reasonable distance, shared facilities with neighbors, or mooring buoys.
- Limit the amount and types of mooring facilities that are allowed for each residence. If a mooring buoy is needed for adequate water depth, a long dock may not be necessary.
- Limit the total square footage of the overwater structures.
- Require floats to be removed during the off-season or during fish migration periods.
- Require removal of all or part of bulkheads as mitigation for moorage facilities.
- Make sure you address the preferences for shorelines of statewide significance in RCW 90.58.020.

## **Non-SMA regulations and permit conditions**

Various federal and state agency regulations and permit conditions are relevant to construction of piers and docks and other structures. Local governments should not rely exclusively on these and adopt them by reference in their SMPs. They may not address local shoreline conditions as reflected in the inventory and characterization or may not be consistent with the Shoreline Management Act. Also, federal agencies cannot deny permits for overwater structures.

However, these regulations will be in force as other agencies review permits for piers and docks, so we're including a summary of them here.

### **U.S. Army Corps of Engineers**

The Army Corps of Engineers (Corps) Seattle District has developed Regional General Permits (RGPs) for specific geographic areas and proposed uses or activities. RGPs are “issued on a regional (limited geographic scope) basis for a category of activities when those activities are substantially similar in nature and cause only minimal individual and cumulative impacts on the aquatic environment.”

Five RGPs are particularly related to shoreline management in Washington state – RGPs 1, 3, 4, 5 and 6. These apply to watercraft lifts, overwater structures such as piers and docks, moorage pilings, and fills and stabilization. The Corps lists the RGP descriptions as follows and includes links to the full text of the RGPs on its website at

[http://www.nws.usace.army.mil/PublicMenu/Menu.cfm?sitename=REG&pagename=mainpage\\_RGPs](http://www.nws.usace.army.mil/PublicMenu/Menu.cfm?sitename=REG&pagename=mainpage_RGPs).

- RGP 1 - Watercraft lifts in Washington State.
- RGP 3 - Construction of new or modification of existing residential overwater structures and installation of moorage piling in Lake Washington, Lake Sammamish, the Sammamish River and Lake Union, including the Lake Washington Ship Canal.
- RGP 4 - Piers, ramps, floats, piling, minor fills and bank stabilization in the Pend Oreille River and Lake Chelan.
- RGP 5 - Maintenance, modification and construction of residential overwater structures in the Mid-Columbia and Lower Okanogan Rivers within the State of Washington.
- RGP 6 - Maintenance, modification, and construction of residential overwater structures in inland marine waters within the State of Washington.

For each of the RGPs, the Corps has conducted and completed consultation with other federal agencies on provisions of the Endangered Species Act (ESA) Section 7 and Essential Fish Habitat (EFH) provisions and with Ecology on water quality certification, if applicable. Projects that comply with terms and conditions of the RGP are likely to receive Corps approval faster than projects that do not comply with the RGP. Projects that do not comply with the terms and conditions of the RGPs would require ESA and EFH consultation, a process that could take a year or more.

Some local governments are including the Corps' RGP standards, or the standards with some variations, in their SMPs. The City of Kirkland included the Corps' RGP 3 standards for maximum area, length, width, height, minimum water depth, decking materials, and pilings in the SMP, with one exception. Kirkland allows a moorage depth of 10 feet, while the Corps' moorage depth is 9 feet. Therefore, a pier proposed to reach water depths of 10 feet would be consistent with the City's SMP, but would not be consistent with RGP3 and would require the full ESA consultation process.

## **Washington Department of Fish and Wildlife**

The Washington Department of Fish and Wildlife requires Hydraulic Permit Approval (HPA) permits for construction or repair of piers and docks and boat launches, pile driving, and other activities that "will use, divert, obstruct, or change the natural flow or bed of state waters" (Chapter 77.55 RCW). Projects may be approved with conditions to prevent damage to fish habitat. Information about the HPA is available at <http://wdfw.wa.gov/licensing/environmental.html>.

WDFW's web page on [Habitat Restoration and Protection](#) provides links to documents on conserving fish and wildlife, priority habitats and species and other topics.



## Washington Department of Natural Resources

The Washington Department of Natural Resources (DNR) is developing an aquatic lands habitat conservation plan (HCP) for all 2.6 million acres of state-owned aquatic lands. The HCP will include avoidance and minimization measures for overwater structures including piers, docks, wharves, boat launches and ramps, boat houses and sheds, floating homes, mooring buoys, nearshore buildings, rafts, floats, marinas, shipyards and terminals. Programmatic measures include protection of freshwater and marine aquatic vegetation; forage fish spawning habitat; and landscape priorities.

DNR expects to begin implementing the HCP mitigation measures as part of its aquatic lands leasing program in 2012. More information is available at the DNR website at [http://www.dnr.wa.gov/ResearchScience/Topics/AquaticHCP/Pages/aqr\\_aquatics\\_hcp.aspx](http://www.dnr.wa.gov/ResearchScience/Topics/AquaticHCP/Pages/aqr_aquatics_hcp.aspx)

## Addressing moorage facilities in the SMP

Piers, docks, floats, mooring buoys and the other structures discussed in this document must be addressed in the SMP. Local governments cannot rely on regulations enacted by federal and state agencies. The SMP should state the shoreline environment designations where these structures can be built and establish policies and regulations for construction, repair and maintenance, and redevelopment.

SMP language should be clear and precise. If a permit is appealed, the Shorelines Hearings Boards and the courts will review the SMP to determine whether the proposal is consistent with it. For example, some SMP regulations require applicants to show that existing facilities or alternative moorages are not adequate, or not feasible, as part of their application for a new dock. SMPs should be clear about what is “adequate” or “feasible.” What would applicants need to provide to show this? Can you establish criteria such as distance from the project site to available moorage, drive time to available moorage, or a time period when a marina berth is available (6 months, or 9 months)?

This section offers some things to think about and examples of policies and regulations from approved SMPs. SMPs approved by Ecology can be found at Ecology’s website at <http://www.ecy.wa.gov/programs/sea/shorelines/smp/status.html>.

## Inventory and characterization

Use your inventory and characterization to help determine where moorage facilities should be located. They are not appropriate everywhere. Consider environmental impacts, ecological functions, navigation, and aesthetics. For example, small coves with limited maneuverability and pristine shorelines perhaps should be off-limits to moorage facilities. Or, the SMP may permit piers and docks in some areas, but prohibit boat houses due to environmental and aesthetic impacts.

## Examples

### *Whatcom County SMP*

23.100.09.A 4. Docks, piers and mooring buoys, including those accessory to single family residences, should avoid locations where they will adversely impact shoreline ecological functions or processes, including currents and littoral drift.

23.100.09. C. 8. Natural (shoreline environment): Moorage is prohibited, except public access, interpretive or nature observation facilities that are compatible with the area's physical and visual character may be conditionally permitted subject to policies and regulations of this Program. Covered and floatplane moorage are prohibited.

### *Douglas County Regional SMP*

5.10 Regulations. 23. Moorage facilities shall avoid locations that will adversely impact shoreline ecological functions or processes.

### *Town of Coupeville SMP*

16.30.360.D.9.b.i. Ensure that piers and docks are:

- (a) Compatible with the shoreline area where they are located. Consideration should be given to shoreline characteristics, tidal action, aesthetics, ecological functions, and adjacent land and water uses.
- (b) Discouraged at locations where critical physical limitations exist, such as shallow, sloping bottoms; areas of frequent high wind, wave, or current exposure; high littoral drift areas; or slide prone and/or feeder bluffs.

16.30.360.D.9.d.i. Piers and docks shall be permitted in the Historic Urban and Urban Aquatic environments for port and commercial water dependent uses and public access uses only subject to the policies and regulations of this master program.

### *City of Kirkland SMP*

Policy SA-8.1: Locate new boating facilities and allow expansion of existing facilities at sites with suitable environmental conditions, shoreline configuration, and access.

### *City of Redmond SMP*

20D.150.70-030(2). Restricted locations. In-water structures shall be located away from critical habitat areas and public access facilities as follows:

- a. In-water structures shall not be located in salmon and steelhead spawning areas or freshwater clam beds.
- b. Marinas, boat ramps, float plane facilities and community boat docks shall be located a minimum of 100 feet from critical wildlife nesting areas, natural lake beaches, and Category I and II wetlands. Greater buffers may be required pursuant to RCDG 20D.140.20-050, Alteration of Fish and Wildlife Habitat Conservation Areas.
- c. Marinas, motorized boat ramps, floatplane facilities, and private docks or piers shall be located a minimum of 100 feet from a public swimming beach.
- d. Marinas and boat ramps are prohibited on Bear and Evans Creeks. Marinas are prohibited on the Sammamish River.

- e. Floats are allowed on Lake Sammamish only.

### ***Town of Darrington SMP***

Boating Facilities – Regulations - 8. Docks and piers shall not be allowed in the Darrington shoreline jurisdiction and are prohibited uses along the Sauk River.

## **Definitions**

Prepare definitions. The SMP Guidelines do not have definitions for moorage facilities, so you are free to write your own. Be careful to make sure that definitions are consistent with each other. It will be helpful to define “normal maintenance and repair” and “reconstruction.” If more than 50 percent of the structure needs to be replaced, is that maintenance and repair, or is it reconstruction? What regulations would apply?

### **Examples**

#### ***Douglas County Regional SMP***

Chapter 8. 70. “Dock” means all platform structures or anchored devices in or floating upon water bodies to provide moorage for pleasure craft or landing for water-dependent recreation including but not limited to floats, swim floats, float plane moorages, and water ski jumps. Excluded are launch ramps. (Note: The definition also includes private, public, joint use and community docks.)

#### ***City of Kirkland SMP***

83.80.12. Boat Launch: Graded slopes, slabs, pads, planks, or rails used for launching boats by means of a trailer, hand, or mechanical device.

83.80.13. Boat Lift: Lifts for motorized boats, kayaks, canoes and jet skis. Includes floating lifts that are designed to not contact the substrate of the Lake; ground-based lifts that are designed to be in contact with or supported by the substrate of the Lake; and suspended lifts that are designed to be affixed to the existing overwater structure with no parts contacting the substrate.

83.270.6. Replacement of entire existing pier or dock, including piles OR more than 50 percent of the pier-support piles and more than 50 percent of the decking or decking substructure (e.g. stringers). Must meet the dimensional decking and design standards for new piers as described in KZC 83.270.4.a, except the City may administratively approve an alternative design described in subsection b. below.

## **Size, location and other specifics**

Develop specific regulations regarding size, location, materials and other specifications. Consider whether all uses that are occurring on or near the water need to be there and should be allowed. Could overwater trampolines interfere with navigation? Would boat houses affect shoreline aesthetics? Some SMPs prohibit private docks if public docks or private moorage is available.

Your SMP should address the following uses:

- a. Piers and docks: location, length, width, minimum water depth, maximum surface area, height of pier, decking materials, location of ells and fingers, gangways and pilings.
  - i. Can ells and fingers reduce the need for long piers and docks?
  - ii. If eelgrass is present, piers and docks may need to be longer so that boats are moored away from eelgrass.
  - iii. How far apart should piers and docks be from other piers and docks to assure that watercraft have adequate room to maneuver? How far should pier and dock combinations be from property lines?
- b. Boat houses: Location, length, width, height, maximum surface area, materials.
- c. Recreational floats: Location, moored to substrate or land, accessories such as diving boards and trampolines.
- d. Watercraft lifts and canopies: Location, materials, moored to substrate or land.
- e. Boat launches/ramps: Location, materials, maximum water depth for end of ramp.
- f. Mooring piles and buoys: Location, setbacks from piers or other piles or buoys, moored to substrate or land. Should mooring piles be required in place of piers and docks?
- g. Railways: Location, maximum length, materials, attachment to substrate.

### Examples

#### *Whatcom County SMP*

23.100.09.B.7.b. Docks with or without a float shall be the minimum size required to provide for moorage. Single family docks and floats shall not exceed 40 feet in length measured perpendicularly from the OHWM nor exceed 3 feet in height above the extreme high water level. Shared moorage may extend to 80 feet in length if demonstrated to be necessary to provide adequate moorage. In the case of pile docks at marine or river locations, the height shall be limited to that which may be reasonably necessary to accommodate landing and moorage of watercraft. Commercial docks shall be the minimum length necessary to serve the type of vessel served.

23.100.09.B.8. In order to minimize impacts on nearshore areas and avoid reduction in ambient light level:

- a. The width of piers, docks and floats shall be the minimum necessary and shall not exceed 4 feet in width, except where specific information on use patterns justifies a greater width. Marine floats shall not exceed 8 feet in width nor 40 feet in length and freshwater floats shall not exceed 6 feet in width and 20 feet in length unless authorized by a variance. Exceptionally large vessels or vessels that require a relatively deep draft may be required to use a buoy, other alternative mooring scheme, or to moor in a marina. Materials that will allow light to pass through the deck may be required where width exceeds 4 feet.
- b. Dock surfaces designed to allow maximum light penetration shall be used on walkways or gangplanks in nearshore areas.



c. Piers, docks and floats shall be located along a north/south orientation to the maximum extent feasible.

***City of Kirkland SMP***

83.270.4. Maximum Area: surface coverage, including all attached float decking, ramps, ellis and fingers

480 sq. ft. for single property owner

700 sq. ft. for joint-use facility used by 2 residential property owners

1000 sq. ft. for joint-use facility used by 3 or more residential property owners

These area limitations shall include platform lifts.

Where a pier cannot reasonably be constructed under the area limitation above to obtain a moorage depth of 10 ft. measured below ordinary high water, an additional 4 sq. ft. of area may be added for each additional foot of pier length needed to reach 10 ft. of water depth at the landward end of the pier, provided that all other area dimensions, such as maximum width and length, have been minimized.

***Douglas County SMP***

5.10.13. Commercial covered moorage may be permitted only where vessel construction or repair work is to be the primary activity and covered work areas are demonstrated to be necessary over water, including demonstration that adequate upland sites are not feasible. All other covered moorage is prohibited.

5.10.17. No pier, dock, or watercraft or houseboat moored thereto shall be used for a residence. Boaters may not reside in their vessels for other than short term recreational use, not exceeding 14 days in any sixty day period.

## **Joint use piers and docks**

The SMP Guidelines state that master programs should include provisions to require new residential development of two or more dwellings to provide joint use or community dock facilities. The purpose of joint use docks is to reduce the proliferation of piers and docks. A joint use dock should be shared by shoreline property owners, not a shoreline owner and an upland owner. When will the SMP require joint use docks? When can applicants opt out of this requirement?

### **Examples**

***City of Kirkland SMP***

83.270.1.b. In the following circumstances, a joint use pier shall be required:

- 1) On lots subdivided to create one or more additional lots with waterfront access rights.
- 2) New residential development of two or more dwelling units with waterfront access rights.

***Whatcom County SMP***

23.100.09.B.3. Shared moorage shall be required in accordance with the following to prevent the proliferation of moorage facilities:

a. Shared moorage shall be provided for all new residential developments of more than two (2) dwelling units. New subdivisions shall contain a restriction on the face of the plat prohibiting individual docks. A site for shared moorage should be owned in undivided interest by property owners within the subdivision. Shared moorage facilities shall be available to property owners in the subdivision for community access and may be required to provide public access depending on the scale of the facility. If shared moorage is provided, the applicant/proponent shall file at the time of plat recordation a legally enforceable joint use agreement or other legal instrument that, at minimum, addresses the following:

- (1) Apportionment of construction and maintenance expenses;
- (2) Easements and liability agreements; and
- (3) Use restrictions.

b. On marine shorelines a dock or pier may be approved only if it is not feasible to provide mooring buoys with an adequate landing area or a dock sized to accommodate tenders.

c. Where a multifamily residential development, camping club or subdivision development provides shared moorage, space for the number of waterfront lots or dwelling units may be provided with an additional provision for sites without water frontage up to a ratio of 1.25 moorage spaces per total lots or units.

d. Prior to issuing a permit for shared moorage, a proponent shall file with the Whatcom County Auditor a legally enforceable joint use agreement that at minimum, addresses the following:

- (1) Apportionment of construction and maintenance expenses;
- (2) Easements and liability agreements; and
- (3) Use restrictions

## Environmental impacts

Develop policies and regulations that will reduce the impacts of moorage facilities on the shoreline environment. Treated wood should be prohibited in the water. Piles should be spaced to allow drift and wave patterns to continue. Grated decking will allow light to reach the water.

### Examples

#### *Whatcom County SMP*

23.100.09.B 6. Piers and docks shall be constructed of materials that will not adversely affect water quality or aquatic plants and animals over the long term. Materials used for submerged portions of a pier or dock, decking and other components that may come in contact with water shall be approved by applicable state agencies for use in water to avoid discharge of pollutants from wave splash, rain or runoff. Wood treated with creosote, pentachlorophenol or other similarly toxic materials is prohibited. Piers and docks in lakes providing a public water supply shall be constructed of untreated materials, such as untreated wood, approved plastic composites, concrete or steel.

23.100.09.B 10. C. Pile spacing shall be the maximum feasible to minimize shading and avoid a "wall" effect that would block or baffle wave patterns, currents, littoral drift, or

movement of aquatic life forms, or result in structure damage from driftwood impact or entrapment.

23.100.09.B 20. Storage of fuel, oils, and other toxic materials is prohibited on docks and piers except portable containers when provided with secondary containment.

***Town of Coupeville SMP***

16.30.360.D.9.c.iii. All docks shall have stops to keep floats off the tidelands at low tide.

***Douglas County SMP***

5.10 Regulations 7.d. Moorage shall be designed to avoid the need for maintenance dredging. The moorage of a boat larger than provided for in the original moorage design shall not be grounds for approval of dredging.

5.10 Regulations 24. Applicants for moorage facilities shall provide habitat surveys, critical area studies, and mitigation plans as required by Section 4.1, Ecological Protection and Critical Areas. A slope bathymetry map may be required when deemed beneficial by the Administrator for the review of the project proposal.

***City of Redmond SMP***

20D.150.70-040(2). Proposals for in-water structures shall mitigate adverse impacts to fisheries, aquatic and wildlife resources, shoreline and native aquatic vegetation, and impacts to other natural shoreline systems. Mitigation may include, but is not limited to, joint use of existing structures, open decking on piers, replacement of non-native vegetation, installation of in-water habitat features, or restoration of shallow water habitat. All proposals for in-water structures, except for single-family residential docks and piers, shall, at a minimum, meet the requirements of RCDG 20D.140.20-060, Riparian Stream Corridor Performance Standards and RCDG 20D.140.30-040, Wetland Performance/Design Standards.

***Town of Darrington SMP***

Boating Facilities – Regulations - 2. Boat launch ramps shall be located on stable shorelines where water depths are adequate to eliminate or minimize the need for channel maintenance activities.

## **Commercial and industrial facilities**

Policies and regulations should address commercial and industrial facilities if they are present or expected to be developed.

### **Examples**

***Douglas County SMP***

5.10 Regulations 1.3 Commercial covered moorage may be permitted only where vessel construction or repair work is to be the primary activity and covered work areas are demonstrated to be necessary over water, including demonstration that adequate upland sites are not feasible. All other covered moorage is prohibited.

***Whatcom County SMP***

23.100.09.B .4. Commercial docks shall be permitted only for water-dependent uses, and only if the applicant/proponent demonstrates that existing facilities in the vicinity, including marinas and shared moorage, are not adequate or feasible for the proposed water-dependent use.

**Navigation and safety**

SMP regulations for navigation and safety should address the public's right of navigation and public access, lighting, reflectors, visibility, hazardous structures, spacing and orientation.

**Examples*****City of Redmond SMP***

20.150.70-050(11). Lighting for piers and docks shall be the minimum necessary to locate the dock at night, shall be designed to minimize glare, and shall incorporate cut-off shields or otherwise shall be directed downward toward the dock. Piers, docks and floats that are not lighted shall incorporate reflectors for nighttime visibility.

20.150.70.040(7). In-water structures shall not interfere with the public's right of navigation. Where in-water structures are located adjacent to public piers, public beaches, or other public openspace, such structures shall provide or enhance public access commensurate with the scale of the project's impacts to public access.

***Whatcom County SMP***

23.100.09.A. 5. Moorage should be spaced and oriented in a manner that minimizes hazards and obstructions to public navigation rights and corollary rights thereto such as, but not limited to, fishing, swimming and pleasure boating, as well as private riparian rights of adjacent land owners.

23.100.09.B.11. Moorage buoys shall be placed at a distance specified by the Washington Department of Fish and Wildlife, the Washington Department of Natural Resources, and the U.S. Coast Guard to balance the goals of avoiding nearshore habitat and minimizing obstruction to navigation. Anchors and other design features shall meet Washington Department of Fish and Wildlife standards.

***City of Marysville SMP***

Chapter 5, B. 3 –Piers and Docks. C. Regulations 5. The length of piers and docks shall be limited in constricted water bodies to assure navigability and protect public use. The City may design or require reconfiguration of pier and dock proposals where necessary to protect navigation, public use, or ecological functions.

Regulations 6. All piers and docks shall be constructed and maintained in a safe and sound condition. Abandoned or unsafe docks and piers shall be removed or repaired promptly by the owner. Where any such structure constitutes a hazard to the public, the City may, following notice to the owner, abate the structure if the owner fails to do so



within ninety days and may impose a lien on the related shoreline property in an amount equal to the cost of the abatement.

## Cumulative impacts analysis

The cumulative impacts analysis must address the draft environment designations, policies and regulations regarding moorage facilities. How will you achieve no net loss of shoreline ecological functions? (See Chapter 4, No Net Loss.) Will your shoreline reach a “tipping point” where additional moorage facilities should be prohibited?

### Examples

#### *City of Redmond SMP*

20D.150.70-040(1). Proposals for in-water structures shall provide a pre-construction habitat evaluation, including an evaluation of salmon and steelhead habitat, freshwater clam habitat, and critical wildlife habitat, and a post-construction monitoring plan. They shall also include an evaluation of shoreline ecological functions and demonstrate how the project achieves no net loss of shoreline ecological functions.

## Other issues

Other regulatory issues covered in SMPs include moorage for float planes and maximum time limits for boat occupancy.

### Examples

#### *Whatcom County SMP*

23.100.09.B.5 Private moorage for float planes may be permitted as a conditional use where construction will not adversely affect shoreline functions or processes, including wildlife use. Ecological restoration may be required to compensate for the greater intensity of activity associated with the use.

#### *Douglas County SMP*

5.10 Regulations 5. Private moorage for float planes may be permitted accessory to existing or concurrently proposed moorage where construction would not adversely affect shoreline functions or processes, including wildlife use. Ecological restoration may be required to compensate for the greater intensity of activity associated with the use. An analysis of potential life and navigation safety impacts shall be required in addition to the inclusion of necessary avoidance or mitigation measures by a qualified professional.

5.10 Regulations 17. No pier, dock, or watercraft or houseboat moored thereto shall be used for a residence. Boaters may not reside in their vessels for other than short term recreational use, not exceeding 14 days in any sixty day period.

## References

Blanton, S., Thom, R., Borde, A., Diefenderfer, H., and J. Southard. Battelle Marine Sciences Laboratory, Sequim, Washington. 2002. [\*Evaluation of Methods to Increase Light Under Ferry Terminals\*](#) for Washington Department of Transportation.

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Nightingale, B. and C. Simenstad, University of Washington, 2001. [\*Overwater Structures: Marine Issues\*](#) for Washington Departments of Fish and Wildlife, Ecology and Transportation.

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EnviroVision, Herrera Environmental, and Aquatic Habitat Guidelines Program. 2007 revised 2010. [\*Protecting Nearshore Habitat and Functions in Puget Sound\*](#).

Brennan, J., Culverwell H., Gregg, R. and Pete Granger, Washington Sea Grant. 2009. [\*Protection of Marine Riparian Functions in Puget Sound, Washington\*](#), for Washington State Department of Fish and Wildlife, June 2009.

Washington Department of Natural Resources 2009 Overwater Structures Project.

## Reducing environmental impacts of overwater structures

### Recommendations from Washington Department of Natural Resources

The Department of Natural Resources may apply some of the following habitat stewardship measures on a site-specific basis to its lease holders.

1. No creosote, chromate copper arsenate, or pentachlorophenol treated wood, or other comparably toxic compounds should be used as part of the decking, pilings, or other components of any in-water structures such as docks, piers, rafts, and floats. Treated wood should only be used for above water structural framing and should not be used as decking, pilings or for any other uses.
2. During maintenance, existing treated wood should be replaced with alternative materials such as untreated wood, steel, concrete, or recycled plastic, or encased in a manner that prevents metals, hydrocarbons and other toxins from leaching out.
3. Tires are prohibited as part of above and below water structures or where tires could potentially come in contact with the water (e.g., floatation, fenders, hinges). Existing tires used for floatation should be replaced with inert or encapsulated materials such as plastic or encased foam, during maintenance or repair of the structure.
4. All foam material whether used for floatation or for any other purpose must be encapsulated within a shell that prevents breakup or loss of the foam material into the water and is not readily subject to damage by ultraviolet radiation or abrasion. During maintenance, existing un-encapsulated foam material must be removed or replaced.
5. To prevent scouring of the substrate, power-assisted pressure washing or cleaning of equipment, machinery, or structures in water less than 2 meters (7 feet) deep should be prohibited. In addition, equipment that contains or is covered with petroleum based products should not be pressure washed in or over the water.
6. New covered moorage and boat houses are not allowed. Where existing covered moorage, covered watercraft lifts and boathouses are impacting or occur within important habitats for protected species and their prey, the structures should either be removed by the end of the life of the structure or moved out of the nearshore and littoral areas. In areas not identified as predicted habitat for protected species or their prey, the structures should be replaced or renovated with structures that maximize light transmission. Where covered moorage and covered watercraft lifts are allowed to continue, the replacement structures should be 100 percent translucent or transparent roofing materials that are rated by the manufacturer as having 90 percent or better light transmittance. No side walls or barrier curtains should be allowed.
7. Artificial night lighting should be minimized by focusing the light on the dock surface, and using shades that minimize illumination of the surrounding environment.
8. Species work windows must be used for the timing of any in-water construction, operation or maintenance activities, and to protect protected species and forage fish during sensitive life history phases (e.g., reproduction, migration). In air construction, operation, or maintenance activities may require species work windows to address terrestrial species that use the aquatic environment or where activities occur in proximity to nesting or foraging habitat.

9. New or expanded uses or structures should not be authorized in important habitats for protected species. Important habitats are areas which support key ecological or habitat functions, processes, or elements vital to protected species. These areas include the presence of aquatic vegetation, forage fish spawning or known or predicted habitat for protected species whose state populations are extremely vulnerable, or have small home ranges.
10. All new activities and structures should avoid existing, native aquatic vegetation attached to or rooted in the substrate.
11. New and expanded docks, piers, rafts, and floats should be at least a specified buffer distance from existing native aquatic vegetation attached to or rooted in substrate. The buffer distance for structures docks, piers, wharves, rafts and floats not associated with motorized watercraft suggested is either 8 meters (25 feet) from the edge of the structure or the maximum distance shade will be cast by the structure, whichever is larger. For docks, piers, rafts and floats associated with motorized watercraft, the horizontal buffer distance for structures associated with watercraft suggested is 8 meters (25 feet) from the outside of the vessel whenever there is a vertical buffer of 2 meters (7 feet) of water above the vegetative canopy at the lowest low water within the diameter of the turning circle. When the vertical buffer is less than 2 meters (7 feet) within the diameter of the turning circle, the horizontal buffer distance suggested will be either 8 meters (25 feet) from the outside of the vessel, the maximum distance shade will be cast by the structure, or the diameter of the turning circle, whichever is greater. For this measure the turning circle is defined as 3.5 times the length of the longest vessel to use the structure.
12. Existing docks, piers, rafts and floats that are not located at the appropriate buffer distance from existing native aquatic vegetation attached to or rooted in substrate should be moved, or renovated so that they allow at least 30 percent of ambient light to reach the vegetative canopy. The value of 30 percent was chosen because it is the minimum light value required by vegetation. Timeframes for relocation and renovation should be based on the expected lifespan of the materials used in the structure. Ambient light is measured as the amount of light between the wavelengths of 400 to 700 nanometers, the photosynthetically active range.
13. New or reconfigured structures must be sited to avoid impacts to documented forage fish habitat. In addition, construction and operational activities associated with the authorization must be conducted in a manner that does not affect spawning behavior; disturb spawning substrate or sediment sources that support spawning; or reduce the amount or availability of aquatic vegetation used for spawning. Promote practices which maintain and establish nearshore riparian shading in upper intertidal spawning areas. In areas of documented and/or surveyed eulachon, sand lance and surf smelt spawning beds, new piers should have spans of 12 meters (40 feet) from the shoreline (extreme high water to ordinary high water) waterward to the placement of the first piling to avoid placing pilings in forage fish spawning areas. The distance of 12 meters (40 feet) is based on engineering limitations.
14. In areas that have not been documented as spawning sites, but with characteristics that would support forage fish spawning, existing uses, and proponents of new uses should be required to conduct surveys to determine if the site is used for spawning. Surveys should be conducted by consultants or staff trained and certified in forage fish spawning survey protocols. Surveys should be conducted over a two year period throughout the assumed local spawning season. Implementation of forage fish protections if no spawning is detected in two consecutive survey years should be lifted. If the proponent is unwilling to bear the time and expense of such a survey, the project must be designed and operated under the presumption that forage fish spawning does occur at the site.



15. Existing uses that are located in or adjacent to documented forage fish spawning areas, or spawning areas determined by survey, should be required to develop and carry out a plan to minimize impacts resulting from the use or structure. The specifics of the plan and the timeframe for implementation should be determined and documented in the agreement authorizing use of the site by qualified staff based on site-specific factors. The plan should include the following:  
Work windows for all in-water construction or operational work excluding vessel movement. Proponents should have the option of conducting forage fish spawning surveys to establish site specific work windows within the generalized windows. For work to proceed, the survey must result in no occurrence of viable forage fish eggs. Surveys must be conducted daily during the proposed work period and before work can proceed. Surveys must be conducted by consultants or staff trained and certified in forage fish spawning survey protocols. If the proponent is unwilling to bear the time and expense of such a survey, all in- water work must occur within the generalized work windows. Detailed descriptions of the anticipated affects and how each affect will be minimized are required.
16. For sites adjacent to sand lance and surf smelt spawning areas, all in-water work that has the potential to increase suspended sediments in the spawning area during the spawning period, should require a buffer of at least 0.6 meters (2 feet) vertical separation from the tidal elevation of the spawning bed or a buffer of 55 meters (180) feet horizontal distance from the lower edge of the surf smelt/sand lance spawning habitat zone. In-water work should occur during an outgoing tide when the water line is below the lower edge of a surf smelt/sand lance spawning habitat zone (1.5 to 1.8 meters or 5 to 6 feet MLLW).
17. New structures and facilities should be designed and located so no new bulkheading or armoring of the shoreline is necessary.
18. Enclosed structures, such as boat houses and covered moorage, should be removed where they impact important habitats for protected species.
19. Floating or suspended watercraft lifts should be located greater than 2.7 meters (9 feet) waterward from ordinary high water. For covered watercraft lifts, the lowest edge of the canopy should be at least 2.5 meters (8 feet) above the ordinary high water elevation with the canopy oriented in a north-south direction to the maximum extent practicable. While joint use watercraft lifts are encouraged, only one canopy should be authorized for each lift.
20. To prevent prop scour, boat mooring areas for new docks, piers, mooring buoys, rafts and floats should be located where the water will be deeper than 2 meters (7 feet) at the lowest low water, or where it can be shown that prop scour will not adversely impact aquatic vegetation or increase suspended sediment loads.
21. Floating structures and boats should not rest on the substrate. Specific requirements include:
  - a. New overwater structures should be located in water sufficiently deep to prevent the structure from grounding at the lowest low water, or stoppers must be installed to prevent grounding, keeping the bottom of the structure at least 1.5 feet (0.5 meters) above the level of the substrate.
  - b. Floats, rafts and mooring buoys should use embedded anchors and midline floats to prevent dragging of anchors or lines.
  - c. Boat anchorage systems must be deployed in a manner that prevents dragging of the vessel or line. Midline floats or other technologies which prevent the line from dragging and scouring must be used on anchor lines.
  - d. Watercraft lifts may not be ground based or ground out at any time. Lifts which ground should be removed.

22. Grounding of boats and the need for dredging must be avoided through the use of naturally deep water. The specific measures which will apply to all authorizations include:
  - a. Locating slips for deeper draft boats in deeper water, or mooring deeper draft boats offshore.
  - b. Extending piers and docks into naturally deep water.
  - c. Situating mooring buoys in water deep enough that vessels do not ground at lowest low water.
  - d. Orienting new construction or expansions of complex facilities so that entrances align with natural channels.
23. The portions of piers, elevated docks, and gangways that are over the nearshore/littoral area should have unobstructed grating over at least 50 percent of the surface area. Floating docks 1.5 meters (5 feet) or greater in width, should have unobstructed grating over at least 50 percent of the surface. Floating docks less than 1.5 meters (5 feet) in width should have unobstructed grating over at least 30 percent of the surface. All grating material should have at least 60 percent functional open space. Grating requirements could also be met if the combination of grated surface area and grating open space are equal to or better than the above standards.
24. New or renovated ramps and launches should be an elevated design of sufficient height off the substrate within the nearshore area to minimize the obstruction of currents, alteration of sediment transport, and eliminate the accumulation of drift logs and debris under the ramps or be level with the beach slope within the nearshore area. In instances where the substrate is suitable for forage fish spawning, the structure should also span the spawning area.
25. Gangways should incorporate 100 percent grating with 60 percent functional open space.
26. Skirting should be prohibited. When existing structures undergo maintenance or repair the replaced portions must meet these standards.